Claims

What is claimed is:

1. An optical assembly comprising:

a substrate;

a light emitting device mounted over a major surface of the substrate and having a face;

at least one channel formed in the substrate near the face of the light emitting device; and

at least one photodetector optically coupled to the light emitted from the face, the channel including at least one surface adapted to receive a portion of the face light and reflect it away from the photodetector so that the photodetector receives primarily direct light from the face.

2. The assembly according to claim 1 wherein the substrate comprises silicon.

3. The assembly according to claim 1 wherein the light emitting device comprises a semiconductor laser.

4. The assembly according to claim 1 wherein the channel comprises at least one V-groove formed in the substrate.

5. The assembly according to claim 4 wherein the V-groove has a vertex which is essentially parallel to the face.

6. The assembly according to claim 5 wherein the V-groove has a sloped wall facing the face which makes an angle within the range 10 to 75 degrees with the face.

7. The assembly according to claim 4 wherein the substrate is silicon and the V-groove has surfaces in the <111>crystallographic plane.

8. The assembly according to claim 4 wherein the channels comprise at least two V-grooves.

9. The assembly according to claim 1 wherein the face is the back face of the device.

10. An optical assembly comprising:

a substrate comprising silicon;

a semiconductor laser mounted over a major surface of the substrate and having a back face;

at least one V-groove formed in the substrate near the back face of the laser, the groove including surfaces formed in the <111>crystallographic plane of the substrate; and

an army of photodetectors optically coupled to light from the back face of the laser,

at least one of the surfaces of the V-groove adapted to receive a portion of the light from the backface and reflect it away from the photodetectors so that the photodetectors receive only direct light from the back face.

11. An optical transmitter comprising an optical assembly, an optical filter optically coupled to the assembly, at least one photodetector optically coupled to the filter, and control circuitry electrically coupled to the photodetector, the assembly comprising:

a substrate;

a light emitting device mounted over a major surface of the substrate and having a face;

at least one channel formed in the substrate near the face of the light emitting device, the photodetector being optically coupled to the light emitted from the face, and the channel including at least one surface adapted to receive a portion of the face light and reflect it away from the photodetector so that the photodetector receives primarily direct light from the face.

12. An optical network comprising a transmitter, an optical fiber optically coupled to the transmitter, and a receiver optically coupled to the fiber, the transmitter comprising an optical assembly comprising:

a substrate;

a light emitting device mounted over a major surface of the substrate and having a face;

at least one channel formed in the substrate near the face of the light emitting device; and

at least one photodetector optically coupled to the light emitted from the face, the channel including at least one surface adapted to receive a portion of the face light and reflect it away from the photodetector so that the photodetector receives primarily direct light from the back face.

13. A method of forming an optical assembly comprising the steps of:

mounting a light emitting device having a face over a major surface of a substrate;

mounting a photodetector so as to receive light emitted from the face; and

forming a channel in the substrate in close proximity to the face, the channel including at least one surface adapted to receive a portion of the light from the face and reflect it away from the photodetector so that the photodetector receives primarily direct light from the face.

14. The method according to claim 13 wherein the channel is formed by etching the major surface of the substrate.

15. The method according to claim 14 where the etching forms at least one V-groove in the channel.

16. the method according to claim 15 wherein the substrate is silicon, and the V-groove has walls in the <111> crystallographic plane of the substrate.